Treasury Market Dysfunction and the Role of the Central Bank

by Kashyap, Stein, Wallen and Younger

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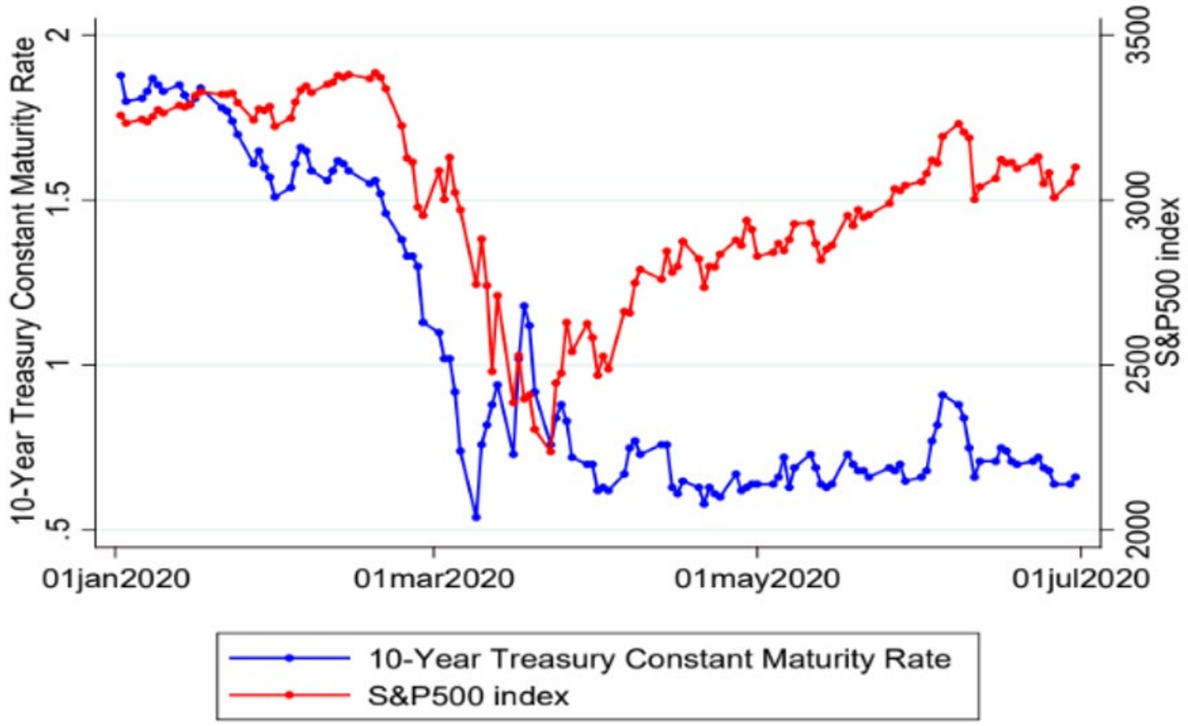
Disclaimer: The views expressed herein are those of the author; they do not necessarily reflect those of the Federal Reserve Board or the Federal Reserve System.

Background: The Treasury yield spike in March 2020

Treasury yields spiked in mid-March 2020 even as S&P500 kept falling: 10 yr yield +64 bps



Not due to inflation or default worries:

- Real, CDS-adj. yield spikes >100 bps

Instead, driven by interaction of:

- Negative Treasury demand shock
- Insufficient intermediation capacity

Background: The Treasury yield spike in March 2020

1. Bond funds: Outflows, disproportionate sold Treasuries to meet them
2. Foreigners: FX intervention
3. Hedge funds: Unwinding levered trades, incl Treasury basis trade

Sector (U.S. Financial Accounts)	Net purchases 2020Q1 ($B)	
Mutual funds	-266	Notes/bonds -260, bills -6
Rest of the world	-287	Notes/bonds -300, bills -13
Household sector, incl hedge funds	-194	

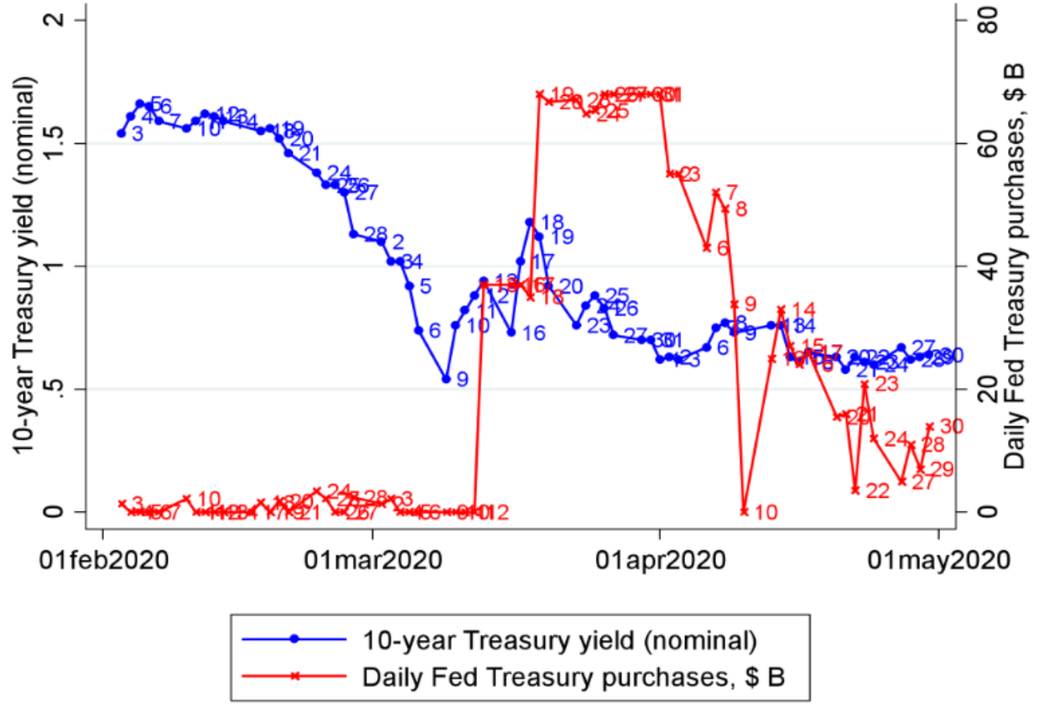
Source: Vissing-Jorgensen (JME, 2021)

Background: Fed market functioning purchases were effective

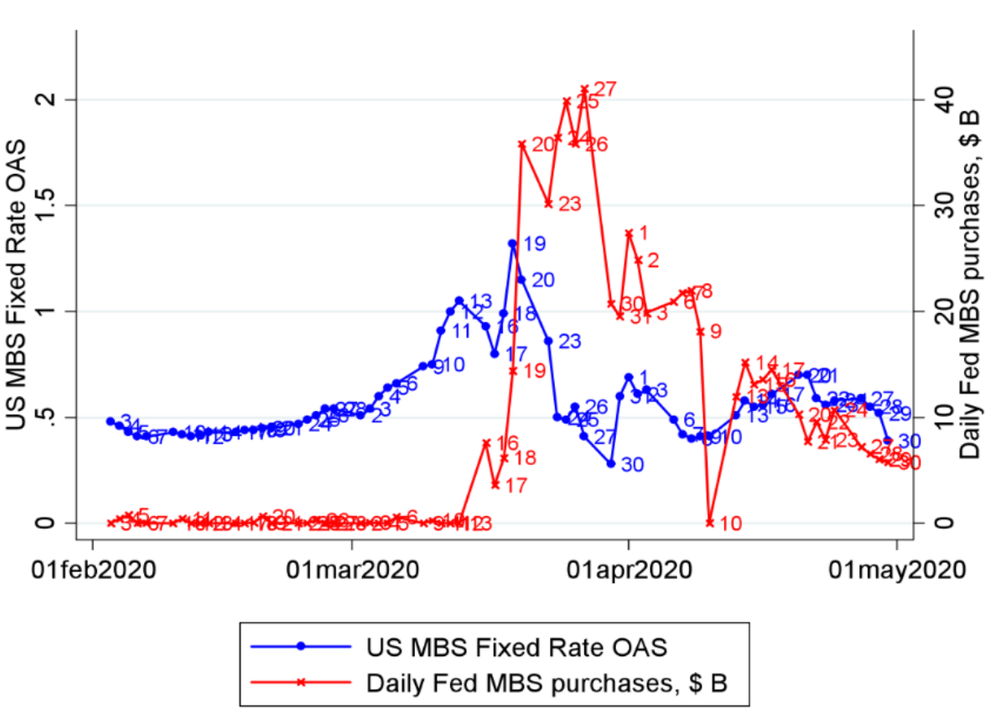
Treasury & MBS yields fell with Fed purchases, not words: Intermediation capacity issues

- Announcements on March 15, 23, but yields fell on day purchases were ramped up
- March 19 for Treasuries, March 20 for MBS – allows good identification

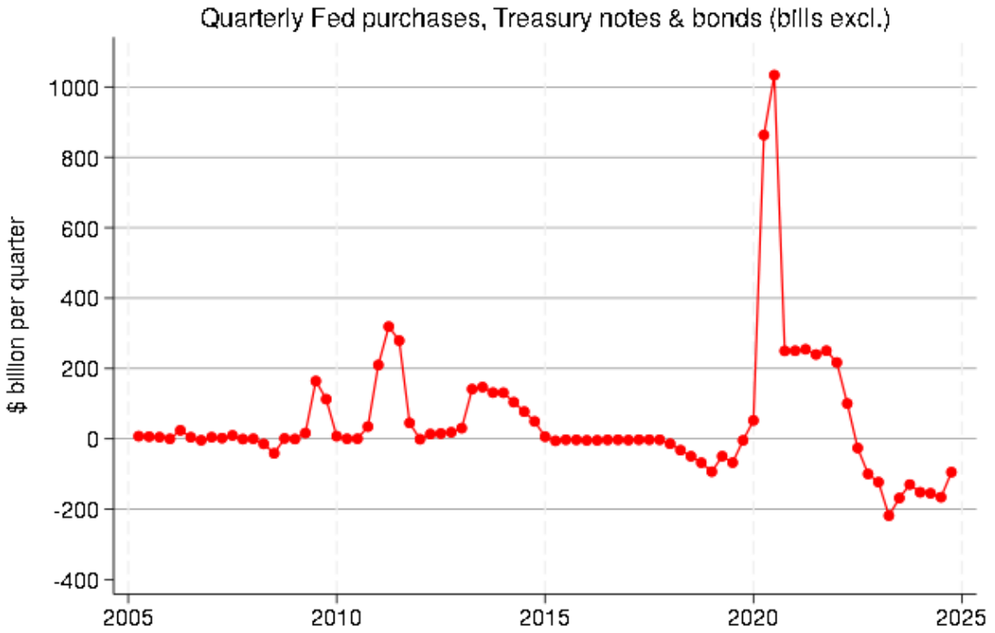
Panel B. Daily Fed Treasury purchases and 10-year Treasury yield

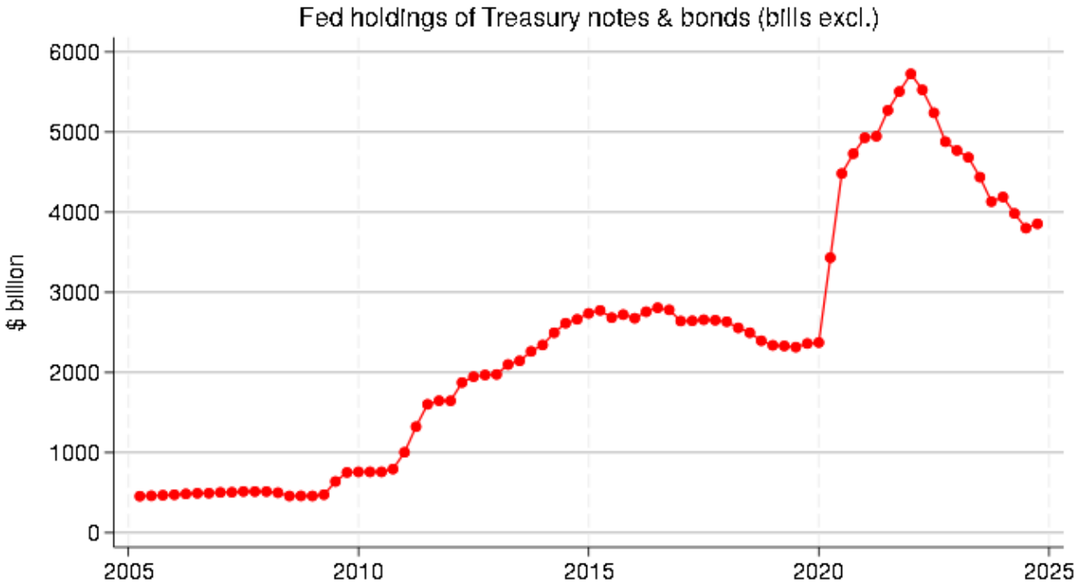


Panel B. Daily Fed MBS purchases and MBS option-adjusted spread



Background: But the Fed kept buying a lot for a long time (until 2022Q1)





Possible problems with this:

1. Did it contribute to high inflation? To the large house price increases?
2. It contributed to large Fed losses (about $1T unrealized losses by end of 2022)
   - The Fed is not here to make money, but still

Paper: ”Morphing” may have led to unintentionally large purchases

- *“Without a clear upfront distinction between bond-buying for market-function purposes, versus for monetary-policy purposes, the initial round of Treasury purchases in the spring of 2020 morphed into a broader monetary policy effort that eventually saw the Fed add over $4 trillion to its combined holdings of Treasuries and agency mortgage-backed securities by mid-2022.*
- *[…] this volume of asset purchases ended up reducing the present value of Fed remittances to the Treasury by roughly $800 billion, potentially representing a substantial hit to taxpayers.”*

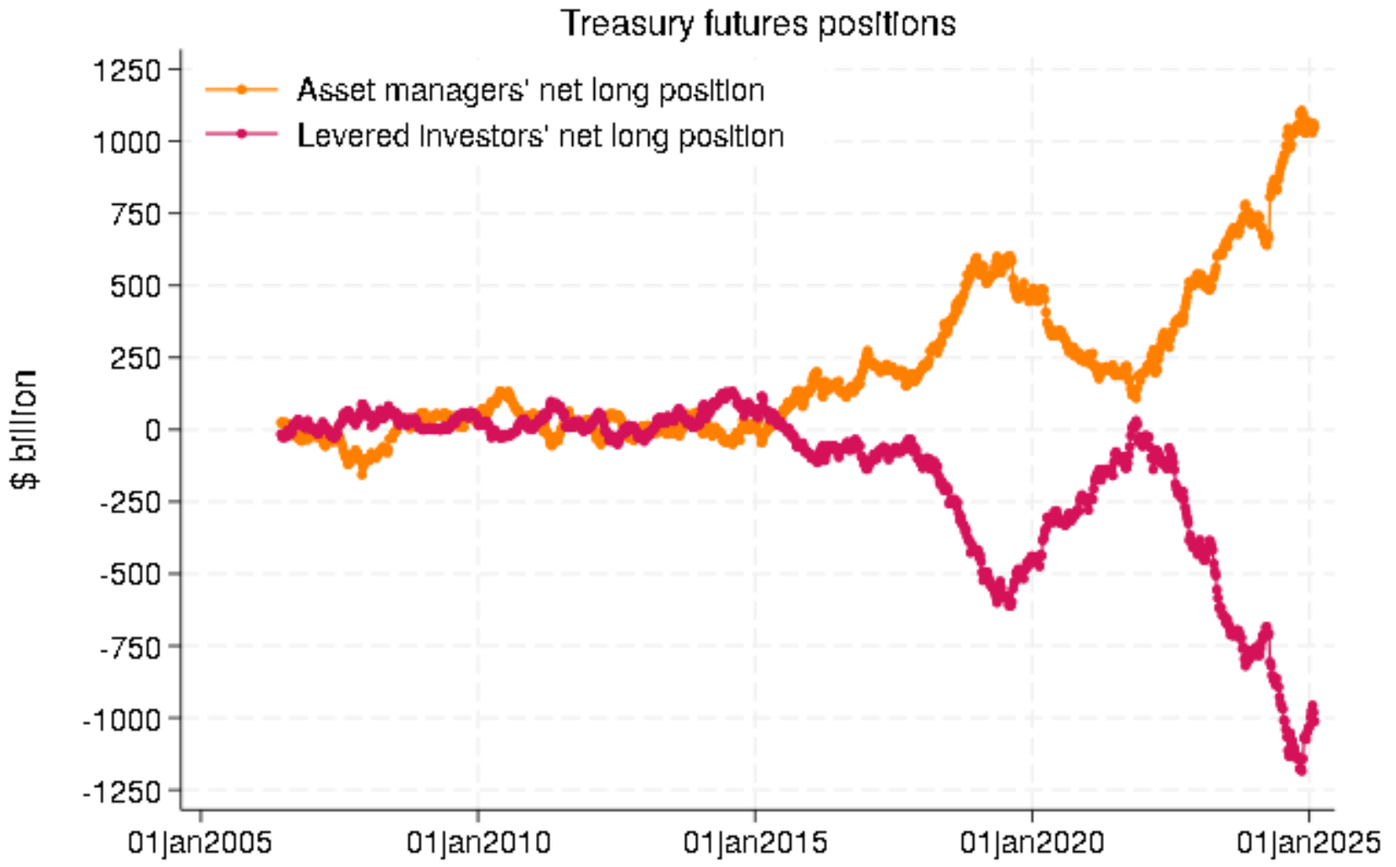
Paper: The Fed should hedge market functioning purchases due to basis trade unwind

The basis-trade is a bundle, the Fed just needs to take over this bundle, a hedged position

Advantages over just buying Treasuries:

1. Clear distinction of market functioning purchases from QE:
   No confusion about policy stance
2. Less Fed profit risk:
   From market-functioning purchases and no excessive QE purchases
3. Less moral hazard (duration-neutral policy)

This is not just history: The basis trade is now likely much larger than pre-COVID



COMMENT 1. The main point is not quite what the authors say

What's the paper saying about Fed intervention?

"… to relieve the stress on dealers, it would be sufficient for the Fed to take the other side of this unwind, purchasing Treasury securities, and fully hedging this purchase with an offsetting sale of futures; this is in effect a more surgical approach to bond-buying."

You may think the paper is saying:

- Fed Treasury purchases are equally effective for market functioning whether hedged or not

In fact, the framework implies that:

- Fed futures purchases have powerful effects on market functioning
- Therefore, Fed Treasury purchases are *more* effective for addressing mkt fct if hedged
  → Hedging could allow for smaller interventions

  (the Fed actually doesn't even have to buy Treasuries, it could focus only on futures)

Stay with me here…

A Treasury futures contract is just "buy now pay later" for Treasuries!

- Asset manager with long futures position:

  Effectively buys the Treasury now but pays an agreed-upon price at the later date
- Could borrow via repo instead, but the logistics are more complicated, and funds would have to disclosure interest paid as fees
- No arbitrage doesn't hold: $P_F \neq P_T(1 + r_{short}) \rightarrow x = \left(\frac{P_F}{P_T} - 1\right) - r_{short}$: Basis

Why do asset managers use leverage?

- In the model: Borrowing goes into riskless asset
- In practice: Asset managers appear to use Treasury futures to get extra non-Treasury exposure while hitting duration targets

The 3 players

1. Asset managers: Mean-var. preferences, fixed bundle $\theta, 1-\theta$ of futures and Treasuries
   - Demand for total Treasuries exposure: Depends on term premium

$$D_{AT} + D_{AF} = A(\theta r_F + (1-\theta) r_T - r_{short})$$

   - Futures demand: $\theta A(\theta r_F + (1-\theta) r_T - r_{short})$

2. Dealers: Supply futures (hedged), funded with equity, and do bond intermediation
   - Equalize marginal returns across activities and have fixed equity

3. Hedge funds: Supply futures (hedged), funded $1-\gamma$ with repo and γ with equity, and also have other trading opportunities
   - Equalize marginal returns across activities and have fixed equity

How do Fed interventions work?

To affect market functioning: Fed needs to affect Treasury basis (x); determined in futures market

- A high basis spills over to intermediation:
  Dealers equalize marginal returns across activities and have limited equity

Futures market clearing:

Dealers' short position(x) + HFs' short position(x) = θ*Asset mgr's Treas. exposure(Term premium)

After hedge funds exit basis trade the Fed has two levers to control the basis (x)

- Enter futures market: To replace hedge funds' supply of short futures positions
- Lower term premium: Lowers asset mgr's demand for Treasury exposure and thus futures

How do Fed interventions work?

Fed can get the basis (x) back to the initial value by either

1. A hedged long Treasury position: Take over HFs Treasury and futures positions
   - Hedged buying increases futures supply one-for-one, keeps futures demand the same

2. An unhedged long Treasury position: HFs' initial position size/θ
   - Unhedged buying lowers futures demand, but only \$$\theta$ per dollar of purchases, and has no effect on futures supply → Need larger position, much larger if θ is small

3. An unhedged short futures position: HFs' initial position size/$(1-\theta)$
   - This increases futures supply one-for-one, but also increases futures demand → Need larger position

COMMENT 2. I’m skeptical that less entangled objectives would have lowered losses

I’m skeptical that less entangled objectives would have lowered losses

Did the Fed buy more than it would have for QE purposes alone due to an excessively long or entangled focus on market functioning?

My take on this:

- No, because the amount perceived as appropriate for QE was likely larger than the market functioning need from 2020Q3 on → Clearer separation of policies wouldn’t have mattered much for losses

A. Market functioning improved quickly. Fed seems to have agreed and acted on it

Kashyap (2024): "The initial purchases were undoubtedly merited on financial stability grounds. I believe that justification was long gone by the summer."

Fed seems to have agreed and acted on it:

- Cheapest-to-deliver Treasuries were excluded from purchases on April 20th
- Daily purchases were adjusted down dramatically from early April.
  Purchase amounts were similar to peak quarterly purchases in QE1/2/3 from 2020Q3
- July 2020 minutes: "The SOMA manager reported that … many market functioning indicators had returned to levels prevailing before the pandemic, and, as a result, purchases were conducted at the minimum pace directed by the Committee."
- Staff gave presentations about QE in the standard sense from June 2020 (see minutes)

B. Fed went all out on both asset purchases and forward guidance

Suggestive that the Fed viewed large stimulus as needed, not that it was confused about market functioning

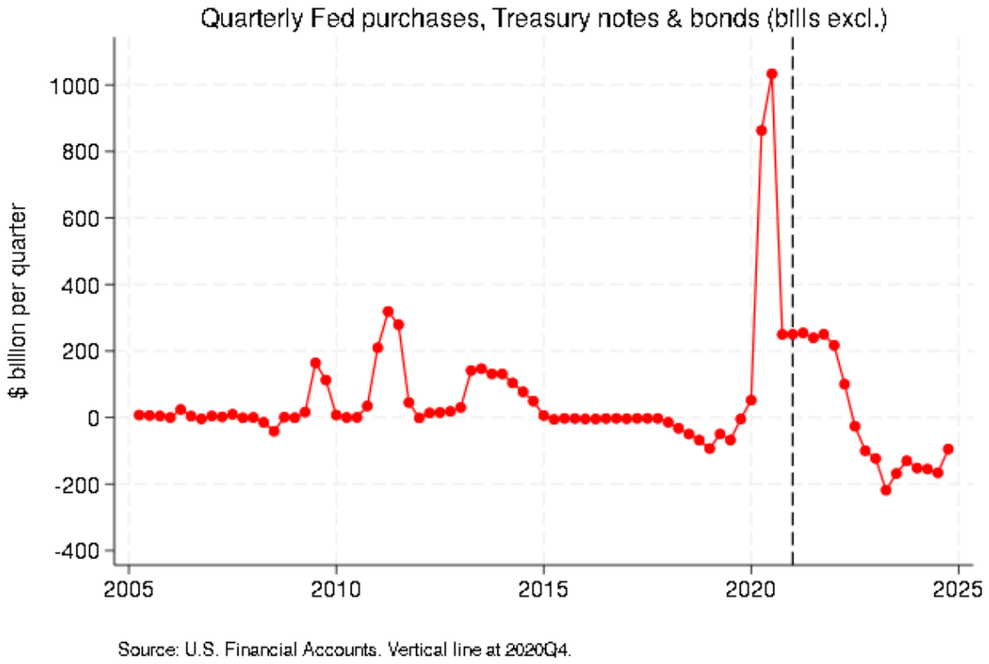
September 2020 statement:

"The Committee … expects it will be appropriate to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2 percent and is on track to moderately exceed 2 percent for some time."

C. No step-down in purchases once the FOMC explicitly focused on monetary policy

December 2020 statement: Outcome-based QE guidance linking buying directly to the economy

"at least $80 billion per month and of agency mortgage-backed securities by at least $40 billion per month until substantial further progress has been made toward the Committee's maximum employment and price stability goals."



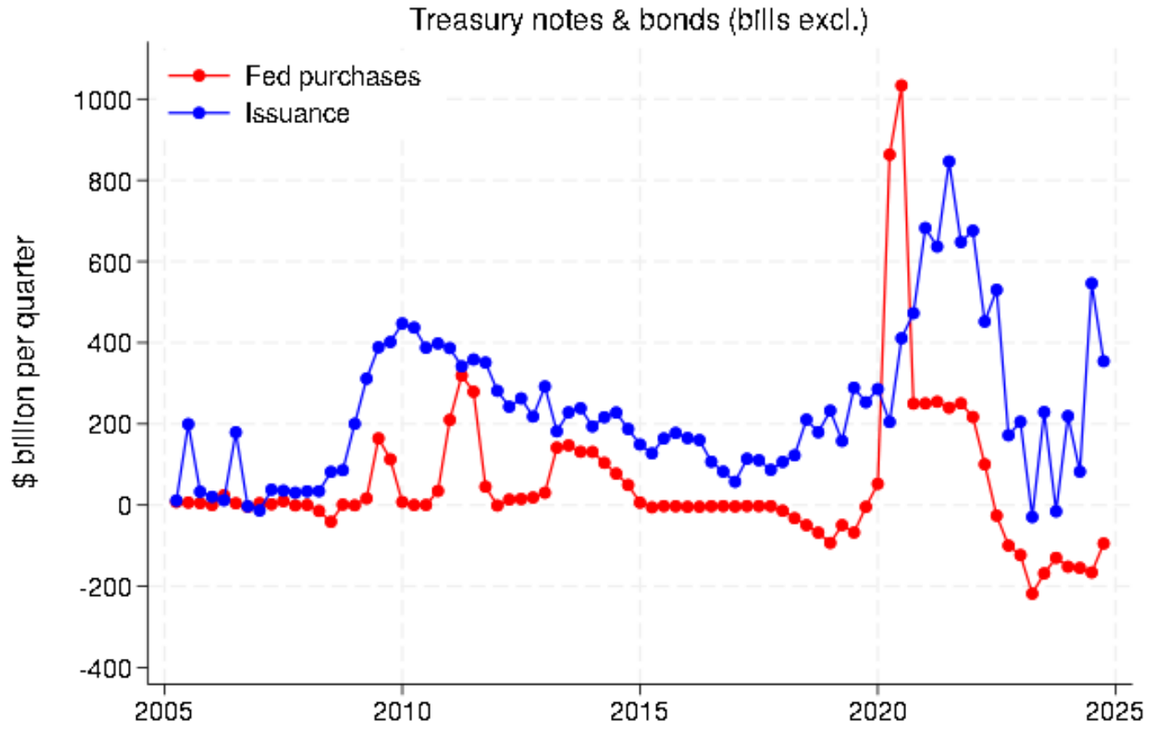
Source: U.S. Financial Accounts. Vertical line at 2020Q4.

- Lingering market functioning concerns from June to Dec 2020 do not appear to have led to inflated purchases during that period

Why might the Fed have come up with so large total QE4 numbers?

Perceived need for large demand stimulus

Related, reasonable calculations of necessary stimulus should account for the upward pressure on yields from increased Treasury issuance



COMMENT 3. Might hedging Fed Treasury purchases help the credit market?

Why do asset managers demand futures? To add credit/MBS while hitting duration target

Figure 16: Bloomberg Agg Index

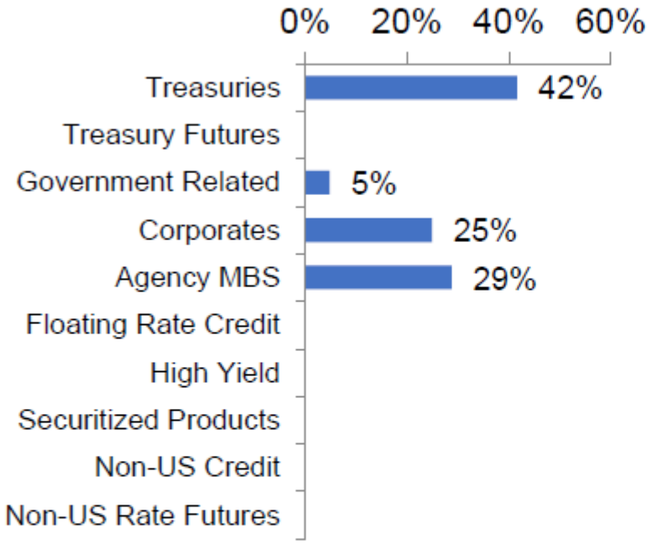
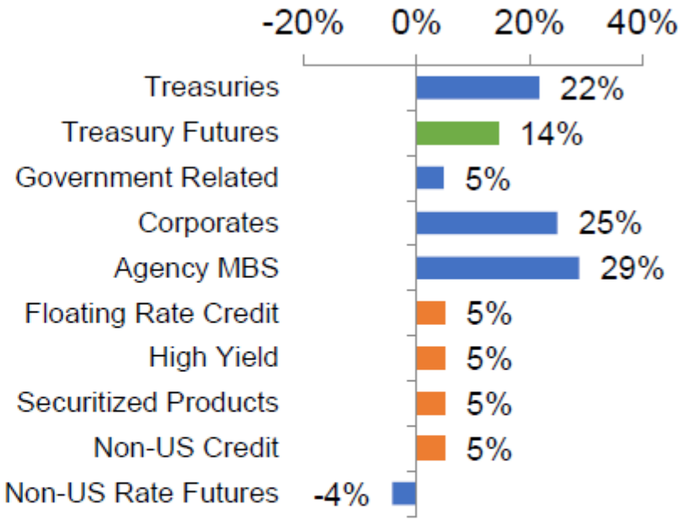


Figure 17: Hypothetical Active Manager



- Lower cash Treasuries
- Add more credit investments
- Add Treasury futures (zero upfront cost)

Same duration, higher yield!

Aggregate Index			Active Manager		
Yield	Duration	Avg. OAS	Yield	Duration	Avg. OAS
4.52	6.17	0.38	5.36	6.17	1.07

Source: Treasury Borrowing Advisory Committee (2024)

Why do asset managers demand futures? To add credit/MBS while hitting duration target

Simpler example (for simplicity, suppose credit has zero duration and futures are overnight)

Without credit

Assets	Liabilities
$100 Treasuries (D=10)	$100 equity (D=10)

With futures and credit investment

Assets	Liabilities
$80 Treasuries (D=10)	$100 equity
$20 Credit (D=0)	
$20 (PV of 10yr Treasuries to be received in futures)	$20 (PV of futures payment)
$120M	$120M

$$\boldsymbol{D_A} = \frac{100}{120} \cdot 10 + \frac{20}{100} \cdot 0 = 8.33$$

$$\boldsymbol{D_E} = \frac{A}{E} \cdot D_A - \frac{L}{E} \cdot D_L = \frac{120}{100} \cdot 8.33 - \frac{20}{100} \cdot 0 = 10$$

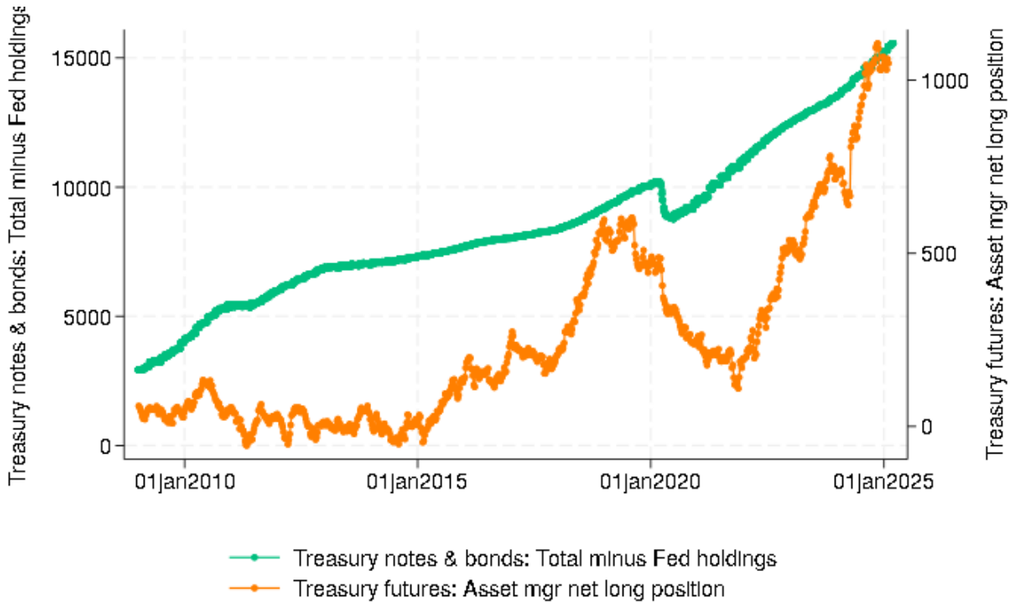
Asset managers' preference for credit and therefore Treasury futures is cyclical

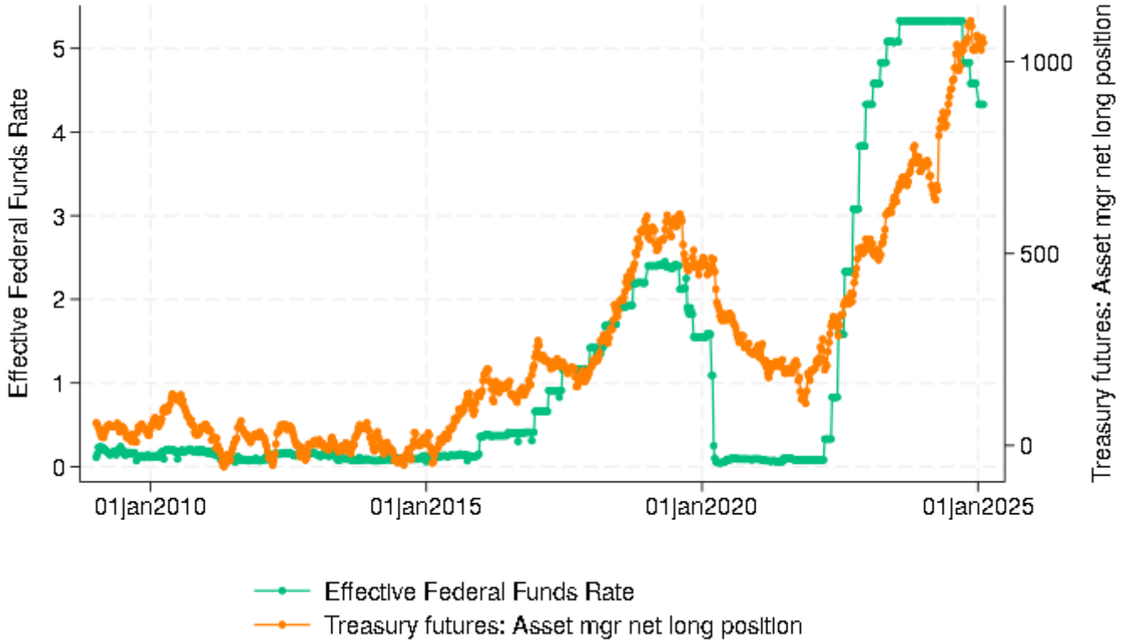
TBAC (2024):

- "Large procyclical deficits have driven Treasury weights higher in bond indices at a time when the economy is relatively healthy and active bond managers prefer credit relative to Treasuries."
- "This cyclical preference for credit, …, may be resulting in lower cash Treasury demand and increased use of Treasury futures."

Asset managers in the data: Two drivers of futures demand

Consistent with this cyclical preference: Asset manager's net long futures positions correlate with both Treasury supply (trend) and the short rate (EFFR) which tracks the business cycle





Asset managers in the data: Two drivers of futures demand

Weekly data Jan 6, 2009, to Feb 4, 2025:

	Asset manager net futures positions		
	(1)	(2)	(3)
EFFR	143.50***		94.43***
Net Treasury note & bond supply (Total – Fed holdings)		0.0800***	0.0361***
	77.70***	-431.7***	-170.7***
N (months)	840	840	840
R^2	0.805	0.731	0.859

* p<0.1, ** p<0.05, *** p<0.01

Asset manager unwind

Asset managers may want to unwind their levered positions for two reasons:

1. Higher credit risk:
   - Makes a leveraged position in credit less attractive
2. Higher (current or expected) funding cost via Treasury futures:
   - Don't want to be last to sell credit

Given 2:

- Do Fed futures positions indirectly help stabilize credit markets by reducing the basis and expected basis?
- Can this help reduce the need for Fed support to credit markets?

Summary

- Perfect Brookings paper:
  - Important topic, intuitive model, supporting evidence and policy implications

- Main policy suggestion is interesting and potentially useful:
  - I'm skeptical it would have reduced losses much
  - But it may allow for smaller interventions
  - And may help the credit market too